

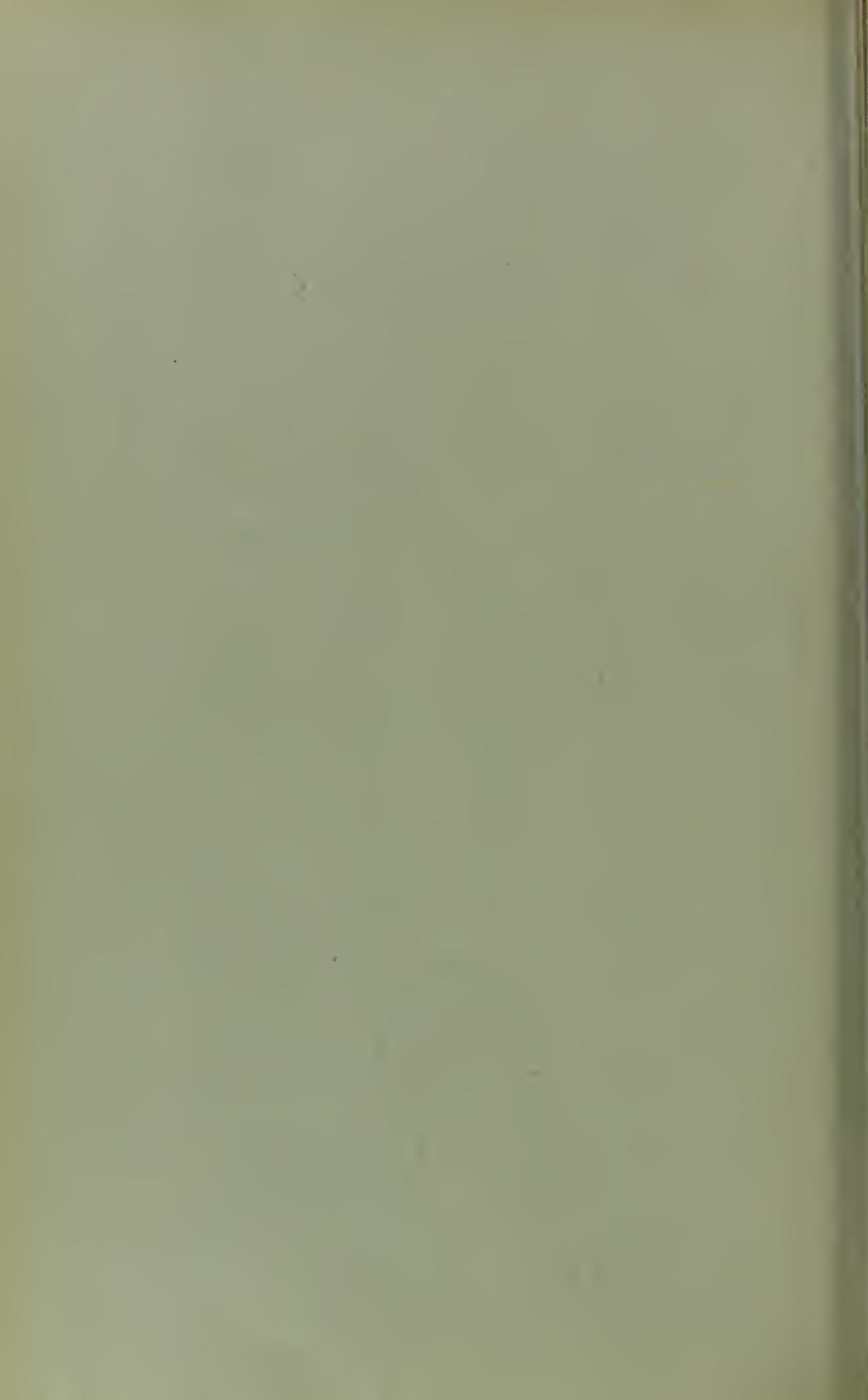
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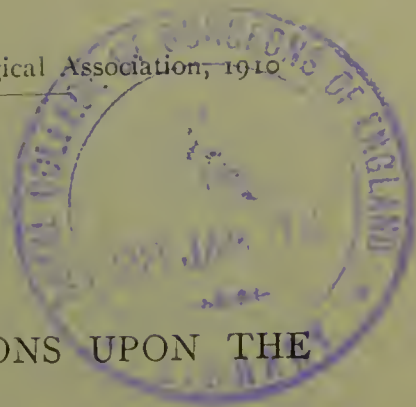
MY EXPERIENCE ABOUT OPERATIONS UPON THE HYPOPHYSIS

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MY EXPERIENCE ABOUT OPERATIONS UPON THE HYPOPHYSIS.

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RECENT investigations have demonstrated the fact that even to the smallest ductless glands must be ascribed a certain significance in the household of nature. Let me remind you of the importance of the thyroid and the parathyroid.

The hypophysis is also an important gland. In 1810, about one hundred years ago, Wenzel expressed the following opinion: "The appendix of the brain seems to play a more important role in the human body than one would be inclined to believe." The truth of this sentence has since been demonstrated by the investigations of our recent times, which proved that the extirpation of the hypophysis either kills the animal or injures it, and it seems that it is the extirpation of the anterior half of the gland which has the deleterious effect, because it seems to have some relation to the growth of the body, to the deposit of fat, and to the development of the genital organs. The hypophysis has also some correlative function to other ductless glands. The purpose of the posterior nervous portion of the hypophysis is hitherto unknown. I shall not enter into the discussion of the physiology of the hypophysis in this paper, since Cushing has debated this point during the meeting of the American Medical Association at Atlantic City, and has added a great deal to this knowledge, showing (as he has told us during the International Congress in Budapest) that it is possible to produce a deposit of fat and a change of character of the animal by the extirpation of the anterior part.

Concerning the clinical experiences of diseases of the hypophysis, it seems to be an established fact that a pathological increase of the function of the anterior portion of the hypophysis produces hyperpituitarism (that is, symptoms of giantism in infants, of acromegaly in adults), while a diminished function produces hypopituitarism, that is, a rapid deposit of fat in the subcutaneous tissue, a persistence of a juvenile type in younger individuals, and a decrease or loss of the genital functions in the adult.

To the first group of pathological conditions belongs the acromegaly described by Pierre Marie. It will be easily diagnosticated in most cases, particularly when headache and disturbances of the optic nerves are present, and if the skiagraph is positive (as Oppenheim first demonstrated).

Besides acromegaly there is another type of disease, the adipose-genital degeneration, which has been explained as hypopituitarism. Though this type of disease has been seen before by different authors (Anderson, Schuster, Uhthoff), the first case which has been diagnosticated and exactly described was observed in the outdoor department of von Frankl-Hochwart, in Vienna, by Froehlich. The diagnosis is based upon general cerebral symptoms (headache, vomiting, epilepsy), upon changes of the optic nerve and an adipose-genital degeneration, which means a regressive change of the breasts in women and a progressive change of this part in men, and anomalies of development of hair. Occasionally there are signs of abnormal temperature, drowsiness, and polyuria. While this observation has shown that there might be a great change of the hypophysis without causing acromegaly, postmortem examination of patients with acromegaly has shown also the absence of macroscopic changes of the gland. Microscopically, however, even in these cases a tumor has been demonstrated, as was proved lately by Erdheim.

The tumor may be a carcinoma (the hypophysis duct carcinoma of Erdheim) or a sarcoma, and finally, it may be mentioned that adenomatous and cystic tumors of benign character have been observed quite frequently.

Operative results of recent years have helped a great deal to clear up these questions. I could observe in two cases operated upon in 1907 a remarkable improvement of the complex of symptoms of hypopituitarism, and Hochenegg¹ and Cushing had in their cases still more conclusive evidences of improvement of the acromegaly after partial removal of the tumor.

This leads me on to the treatment. The first operations on the hypophysis seem to have been performed by the brilliant English surgeon, Victor Horsley. Unfortunately I was unable to get the details of his results. The question of the operative procedure in attacking the hypophysis has been studied on cadavers by Loewe (Berlin) and Koenig, Jr. (Altona), but has been cleared essentially by Schloffer (Innsbruck), who not only studied on a large number of cadavers the accessibility of the hypophysis, but also operated successfully in March, 1907, on a case, the first one on the continent (the patient survived the operation two and a half months). In July, 1907, I operated on my first and in December of the same year on my second case, in both cases successfully, while a third case, operated also in December, 1907, for acromegaly, died of meningitis. In 1908 Hochenegg reported two successes. Cushing followed with one successful case, Kocher with one who survived the operation for four weeks. In addition we have to report a case of Hochenegg and one of Smoler, both of which died after the operation. In America, so far as I know, Cushing had 3, Halstead (Chicago) 2, Mixter 1. So we can judge that the number of recorded cases is still quite a small one, and therefore I will give you, briefly, my own experiences.

I have operated altogether six cases, and will divide the same in three groups. First, three cases of operations for typical hypopituitarism, all cured. Second, two cases of acromegaly, both died. Third, a combination of the first and second group, one case, considerably improved.

FIRST GROUP.

CASE I.—A man, aged twenty years, came to v. Frankl-Hochwart when eleven years of age, complaining of headache and vomiting. His intelligence and vision showed nothing abnormal. At the age of thirteen the patient grew considerably fat, and the vision of his left eye diminished. Later, also, the right eye grew dim.

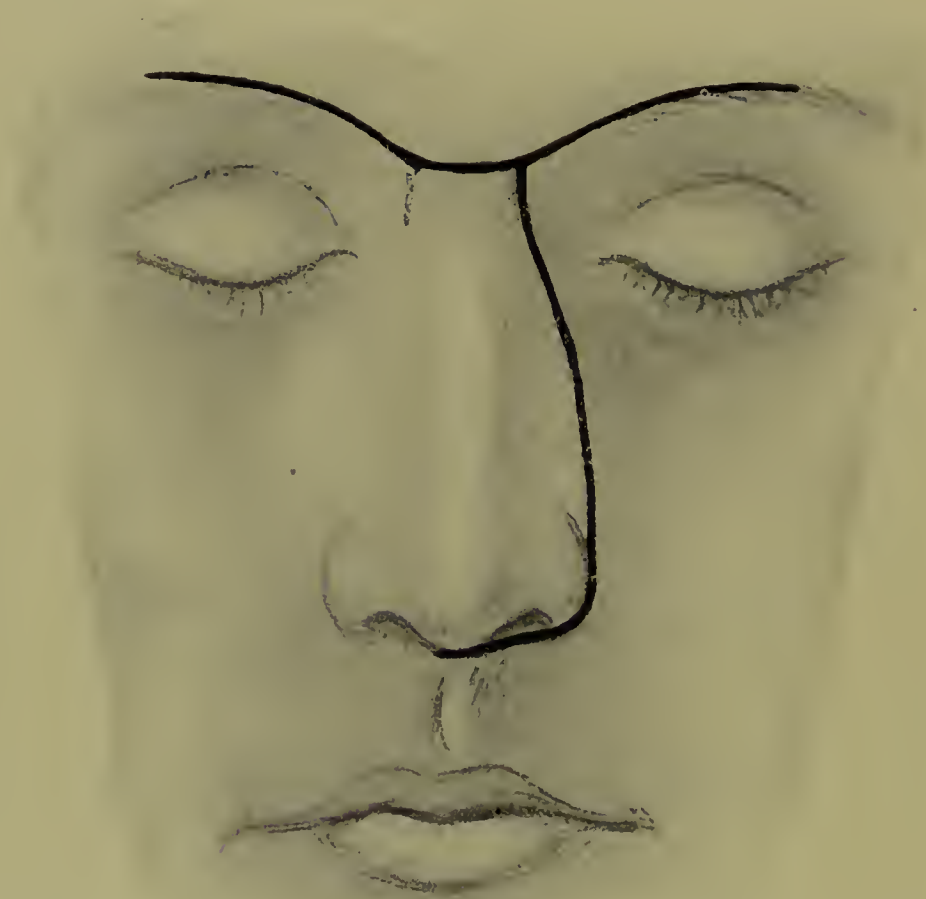


FIG. 1.—The operation on the hypophysis: Lines of skin incision.

Examination showed a light amaurosis, right side, $\frac{5}{20}$ vision, temporal hemianopsy. Thyroidin improved the condition temporarily, then followed a relapse, whereupon v. Frankl-Hochwart, who had kept him under observation for years, referred him to

my clinic for operation.¹ On examining him, the infantile type was the most striking symptom. There was no hair on his body except on his scalp. His right eye showed atrophy of the temporal



FIG. 2.—The operation on the hypophysis: The exposure of the roof of the superior fossa of the nose.

¹ Case reported extensively, *Neurol. Zentralbl.*, 1907. No. 21, "Operation on the Hypophysis by v. Eiselsberg and v. Frankl-Hochwart." Here cited only briefly.



FIG. 3.—The relations of the hypophysis to the roof of the superior fossa of the nose. *A*, transverse section; *B*, anteroposterior section.

half of the papilla. The left eye, genuine atrophy. The skiagraph showed an enlargement of the sella turcica. The anterior clinoid processes were visible, but the back was destroyed. These symptoms led us to the conclusion that a tumor of the hypophysis was present.

Operation June 21, 1907. Morphine-chloroform anesthesia. An incision was made through the nose in the shape of a tuning fork, reflecting the nose to the right side, cutting through the septum, removing the turbinated bones, removing the anterior wall of the frontal sinus; these were the steps of the operation.

On account of a profuse hemorrhage the operation had to be continued in low head position. The vomer was removed, the anterior wall of the sphenoid excised, the sphenoid sinus opened, whereupon in the depth the prominence of the hypophysis became visible.¹ After carefully removing the thin covering of the dura I incised this membrane, and laid open the hypophysis in the exact median line. A brownish-red fluid escaped and our scoop entered a larger cavity. At this moment we could see a distinct pulsation of the borders of the dura mater. Of these edges we removed particles for examination, and packed the cavity with isoform gauze. The skin incision was sutured carefully.

The patient made an uneventful recovery, with only a slight elevation of temperature in the evening.

The microscopic examination proved that the cyst had been formed by a tumor, which showed an infiltrating growth of truly epithelial character. Stoerk, of the Pathologic Anatomic Institute of Vienna, pronounced it an epithelial carcinoma, and thought it belonged to the more benign precancerous state. Whether it was formed in this locality or was a metastatic tumor could not be ascertained.

The symptomatic headache of the patient disappeared and his vision improved. He entered a sanatorium in the country where he lived under very favorable conditions for two months. It was remarkable that he lost two pounds under these conditions in the

¹ I had studied the anatomical relations repeatedly with Prof. Tandler, who kindly assisted me, in his institute of anatomy in Vienna.

country, and particularly pleasant was the improvement of his vision. The temporal field of vision improved so much that the patient was able to go to the railroad station unassisted, and he could, after a time, resume his position as a clerk.

Two years and nine months after this operation we could establish that hair grew on his scrotum, that his general adiposity had decreased, and that his vision had remained continuously better.

CASE II.¹—A man, aged twenty-seven years, a draftsman, always somewhat fleshy, has become considerably fat during the last few years. He complains of severe headache for the past three years, of double vision and occasional vomiting for about a year. For the past few years a peculiar juvenile type is visible on the patient. His sexual appetite has disappeared entirely, and he has become gray haired rapidly of late. He is considerably fat; has no hair except on his scalp; his vision on the right side is such that he sees fingers at a distance of one meter. Bitemporal hemianopsy. The skiagraph reveals total absence of the sphenoid body and of sella turcica, and in its place is a large excavation.

Operation December 20, 1907, performed in the same manner as in the first case (according to the method of Schloffer.) In exploring the hypophyseal tumor severe hemorrhage set in, which could be checked only by the use of small pledgets soaked with adrenalin. From the opening of the dura escaped a soft grayish mass, which could be scooped out and proved to be an angiosarcoma.

The healing was very favorable. After six months the headache was gone, the vision improved to such a degree that patient could read large types.

In March, 1910, two years and three months after his operation, the patient wrote me a letter that he was doing remarkably well, that his vision had improved so much on the left side that he could read newspapers without difficulty. The field of vision, however, does not seem to be increased.

¹ See "Ueber einen neuen Fall von Hypophysis Operation bei Degeneration adiposo-genitalis," von v. Eiselsberg und v. Frankl, Wien. klin. Wochenschr., 1908, Nr. 31.

CASE III.¹—A girl, aged eighteen years, has been suffering for the past two years from vomiting and headaches, and grew fat during this time. She consulted, on account of her vision, Dr. Bichowsky, in Warschau, who found a bitemporal hemianopsy. Right side, vision of one-third; on the left side she could only distinguish fingers. Skiagraph showed an absence of the sella turcica, anterior part. This led to the conclusion that he had to deal with a tumor of the hypophysis cerebri, and he referred the case to v. Frankl-Hochwart in Vienna.

The otherwise frail patient showed a remarkable development of fat, and there was no hair on her pubes. The examination revealed type adiposo-genitalis, a bitemporal hemianopsy, and the skiagraph showed a destruction of the entrance of the sella turcica, the basis of which seemed to be only slightly changed.

Operation December 12, 1908, nearly in the same manner as in the cases described before, with the only exception that, following the advice of Hochenegg, we packed the nasopharyngeal cavity and opened the anterior wall of the frontal sinus temporarily. On account of the very narrow anatomical condition of the nose the operation was quite difficult. After removing the hypophyseal prominence we found a cyst from which we removed about two teaspoonfuls of a chocolate-brown fluid.

The microscopic examination of these contents and a part of the cyst wall gave no evidence of malignancy.

The wound healing process was extremely complicated. For a week the patient seemed to be doing well. Then, after removal of a few strips of gauze, which we had put into a small posterior opening of the frontal sinus, a violent meningitis set in, the lumbar puncture revealed pure pus, consisting of many leukocytes and a mixture of bacteria, in which a good many streptococci could be recognized. The patient seemed to be lost. We injected, however, Paltauf's antistreptococcic serum, and into the veins electragol.

¹ This case was mentioned by me during a discussion in the society of Vienna physicians, and also at the International Congress in Budapest. Later on published extensively by Bichowsky (Warschau) under the title "Zur Therapie und Diagnose der Hypophysis," Deut. med. Wochenschr., 1909, Nr. 36.

In the meantime, however, the culture did not show streptococci, only a *Bacillus faecalis alcaligenes* developed. A few days later the patient improved. Another lumbar puncture yielded clear liquor. During two months the patient recovered permanently. The vision is remarkably improved. On the right side vision is $\frac{2}{3}$ (before the operation $\frac{1}{3}$), left side, $\frac{1}{10}$ (before the operation only movements of the fingers could be discerned). Two months after the operation patient menstruated for the first time, but the menses have not reappeared.

Now (March, 1910) she is absolutely normal, except that we find a temporal hemianopsy on the left side.

SECOND GROUP.

CASE IV.¹—Working woman, aged thirty-three years. Shows for the past eight years signs of typical acromegaly. During the last few months disturbances of vision and severe headaches set in. On admission to the hospital she shows the typical picture of acromegaly. Examination of the eyes yields bitemporal hemianopsy.

She was very anxious to be relieved of her intolerable headaches by a quick operation, which was, however, postponed on account of a nasal catarrh, and she was sent home until this condition improves. After ten days, however, she returned and begged to be relieved of her headaches.

I am sorry I yielded, and undertook the operation December 17, 1907, in a manner described in the former operations. The removal of the tumor of the hypophysis brought forward grayish-red masses, which proved microscopically to be a sarcoma.

The same evening clear symptoms of meningitis set in, which led to an exitus in forty-eight hours.

Postmortem showed a basal sarcoma, extending clear up to the frontal lobes, from which a piece corresponding to the hypophysis had been extirpated. The case was from the start an inoperable one.

¹ Case mentioned Wiener klin. Wochenschr., 1908, 31.

CASE V.—Woman, aged forty years; never had any children. Ten years ago she suffered from severe headaches, which improved after a duration of six months, whereupon a diplopia set in. Nine years ago she showed the first symptoms of acromegaly—insomnia, headaches, and disturbances of digestion. Arsenic and thyreoidin improved the condition only temporarily. For the past six months her condition grew worse, particularly the headaches.

On admission the patient exhibited the typical symptoms of acromegaly with the normal field of vision. On the right side there were some old corneal opacities, with a scotoma on the outside. The vision of the left side is, corresponding to the opaque condition of the cornea, one of an irregular astigmatism. The examination of the nose revealed a chronic catarrhal condition. The skiagraph shows an enormous dilatation of the sella turcica without destruction on the outlines. Very large sphenoidal sinus.

For a number of days the patient had received urotropin, as recommended by Cushing, before I operated on March 9, 1910, in the same manner as before.¹ The operation was very simple, and completed in less than an hour. The dura was incised, and from the region of the hypophysis a tumor mass removed, which was carefully examined by Stoerk in the Pathological Institute of Vienna and pronounced periteal sarcoma, by Erdheim as carcinoma of the hypophysis.

The day after the operation backache and elevation of temperature appeared. A typical meningitis set in, which caused death after three days.

The postmortem showed recent suppurative meningitis (streptococci) on the basal surface as well as on the convexity of the brain. The largest portion of the tumor had been removed by the operation, only small particles were left on the operculum of the sella turcica. Some pneumonia in the lung.

¹ Temporary opening of nose and sinus frontalis.

THIRD GROUP.

CASE VI.¹—Tinsmith, aged thirty-six years, married, father of healthy children, noticed five months ago that his left eye became weaker, and within three months he became blind on that side. At the same time he had intense headaches; the right eye also became worse in its vision. For the last year he had impotency. These symptoms and a skiagraph which showed a distinct enlargement of the sella turcica, with destruction of the outlines of the same, led Archibald Church, of Chicago, to diagnosticate a tumor of the hypophysis, and he advised an operation. Patient came at first into the clinic of Prof. Fuchs in Vienna with his eye trouble. Diagnosis of choked vision in both eyes and a clear, temporal hemianopsy on the right side was established and the patient referred to my clinic.

He did not exhibit any apparent symptoms of acromegaly, but manifest deposit of fat in his subcutaneous tissue. The skiagraph was in accord with the diagnosis of Dr. Church.

January 16, 1909, the operation was performed in a similar manner as previously, and it proved more difficult than any other because the prominence of the hypophysis was hardly visible in the sphenoid sinus. The hypophysis itself was transformed into a large tumor which could be scooped out thoroughly.

The microscopic examination proved it to be epithelial carcinoma.

The course of the wound healing was normal, but the patient gave us a great deal of worry on account of his drowsiness, as it appeared to us as if he was suffering from an abscess, until finally these symptoms disappeared and the patient could be transferred into the clinic of Professor v. Strümpell. He improved in a very short time, but his physicians noticed that his fingers and the anterior parts of his feet became visibly smaller. This was not only caused by the disappearance of his fat after the operation (he lost 20 kilos), but even his clothes which he had worn before his sickness

¹ This case is identical with the Case IV in the article of Archibald Church, Pituitary Tumor in its Surgical Relations, Jour. Amer. Med. Assoc., July 10, 1909.

seemed remarkably longer; for instance, his trousers were four centimeters too long, the foot three centimeters shorter, as his shoes, which had been fitting closely before the operation, proved by actual measurement. His gloves appeared a good deal larger around his wrist, and the fingers seemed about the width of the finger shorter than before in the glove. The stiff hat of the patient fell down over his ears. His size of 39 centimeters was diminished by three centimeters.¹

It seems to me important that the patient who had been impotent for two years had erections in the morning for the first time. The intelligence of the patient has improved, and of his drowsiness we cannot notice anything. His headache has disappeared. The least improvement is in the vision of the patient. His left eye has remained blind. His right eye has slightly improved, but the field of vision is still contracted. Patient left in March, 1910, for Chicago, where I saw him fourteen days ago. He complained about rheumatic pains in his right shoulder.

I have as you see, operated six times on the hypophysis.²

I can state, by the way, that I have seen a case of a boy shot in the head, where the bullet seemed to be lodged in the hypophysis. This is a year ago, and the child has shown no symptoms of dyspituitarism.

While in my first three cases of operation on the hypophysis an improvement of the symptoms of the adipose-genital type (disappearance of the obesity, reappearance of hair, reappearance of sexual function) was noticed, both cases of acromegaly died shortly after the operation. Particularly interesting is Case VI, in which before the operation acromegaly was not manifest, but after the operation the remarkable decrease of circumference of the head, of the size of hands and feet, could be recorded. While this patient, notwithstanding his good nutrition, has lost 2 kilos, I must say that I believe it is a combination of both types. We

¹ I refer for the detail of these conditions, which appear so late after the operation, to the discussion of Dr. Stoerk, in *Sitz. der Ges. f. Inner. Med.*, November, 1909.

² During my trip in America my assistant Dr. Ranzi performed in my clinic an extirpation of hypophysis for type adipose-genitalis with best success.

can also imagine that through the growth of the tumor some parts of the anterior portion of the hypophysis were irritated, while other parts were destroyed. It is the question whether it would not be more rational to change the term of hyper- and hypopituitarism into dyspituitarism. So far as the microscopic examination of my cases is concerned we found: twice (Case I and VI) an epithelial carcinoma; twice (Case II and IV) sarcoma; once (Case V) carcinoma or sarcoma; once (Case III) a cyst.

It is interesting, furthermore, that both cases of acromegaly exhibited a typical malignant growth. In one case it was so extensive, that it involved the frontal lobe. The hypophysis which was removed during the operation was all transformed into a tumor mass. Also in my second case were signs of distinct malignant growth. In both cases, notwithstanding the positive presence of a malignant growth, symptoms of acromegaly were dating back for years, so that we had to conclude that these malignant tumors had grown remarkably slowly, a conclusion which seems to be hard to believe considering the malignant structure of the tumors. Altogether we find a remarkable discrepancy in the comparison of the postoperative course and the microscopic findings. We do not operate radically, even do not intend to do more than to diminish the size of the tumors, or remove the contents of a cyst, and nevertheless we notice such remarkable improvement which we are not accustomed to see in our operations on other parts of the body when we have done such an incomplete operation. We must draw conclusions from this that it is particularly the pressure which has been exerted by the tumor upon the remaining parts of the hypophysis, and which has produced the dystrophy (compare Hildebrand's case). But it is altogether remarkable that my first case, which was operated on almost three years ago has shown a permanent improvement, and similar seems to be the course in Cases II and VI.

A few more remarks as to the technique of the operation. The hypophysis can be exposed by the intracranial route, or through the nasal or buccal cavities. The former method is by far the more difficult, because we have to exert some pressure upon the brain

nerves, and we may injure one of the large vessels. Whether the method which Biedl and Karplus have employed in monkeys of late, in which the brain in Rose's position can be pressed forward half a centimeter, so that the nerves are not injured, is also applicable for man, must be left an open question. At any rate, the intracranial route is heretofore regarded as the more difficult, the nasal route the easier, although it offers a greater danger of infection. We have to pass on our way to the hypophysis through a region saturated with microbes. It is well known that a simple cold immediately increases the virulence of a large number of microorganisms, which are not innocuous for the meninges, and I could, to my sorrow, confirm this in my 2 cases (IV and V), particularly in Case IV, in which I gave in to the patient's demand to operate during a severe cold. Perhaps the chronic catarrh of the nose may be regarded as a constant companion of acromegaly. At any rate, we have to pay attention to catarrhal conditions in such cases. In my fifth case I think I made the mistake that I did not remove enough of the inferior turbinate, so that the cavity became very irregular and easily exposed to infection. In Case III the symptoms of meningitis set in with such a stormy manner, although we had found only a cyst. When my lumbar puncture produced pus in this case I had lost all hope for the patient. But fortunately the virulence seemed to have been a very low one, and the patient passed this danger. At any rate, we have to consider meningitis in the operations on the hypophysis, as I have had two deaths in six cases from this cause; that is by far a much larger percentage than we have in brain operations through the cranial cavity.

Only very few operators have attacked the hypophysis by the intracranial route (Horsley, McArthur, Krause, Borchardt). The majority of operators have used the nasal route. I followed in my operations essentially Schloffer's method. The method developed by Moszkowicz, under the supervision of Tandler in the Anatomical Institute of Vienna, by which the anterior wall of the frontal sinus is definitely removed, and which was modified later and used successfully on a patient by Hochenegg, in a manner of a

temporary resection, is already proposed in Schloffer's work on this subject. This temporary resection is cosmetically a great improvement.

The method which I followed in the last cases was as follows:

Prophylactic use of urotropin according to Cushing's suggestion, anesthesia, packing of the nasal cavity (to prevent the operation in a dependent head position—Hochenegg), temporary resection of the nose and reflection to the right side, whereby the vomer is cut as far back as possible, so as to prevent saddle nose later on, temporary resection of the frontal sinus, total removal of the contents of the nasal cavity, including the posterior part of vomer and turbinated bone, exposure of the anterior wall of the sphenoid sinus, opening of the same, whereby the hypophysis prominence is laid bare. The lamp of Zeiss or a very good head mirror is absolutely necessary. The opening of the sella turcica must be made in the exact median line and not too much anteriorly, to prevent an injury of the carotids and the chiasma. After removal of the tumor or scooping out of the cyst¹ we introduce drainage, pack the nasal cavity,² and suture the skin exactly. The tendency of surgeons now is to perform this operation with least destruction of bones. Kocher³ states, and it seems to me not unjustly, that the temporary resection of the anterior wall of the sinus frontalis is not necessary to lay bare the hypophysis.

Following the very good anatomical research from Kanavel,⁴ the infranasal route for reaching the tumors of the pituitary body is proposed. Halstead, of Chicago, performed this operation twice (once with success). Also Mixer⁵ operated by reflecting the nose toward the front; the scar was scarcely to be seen. Hirsch (Vienna)

¹ We can hardly ever remove the entire hypophysis, as Cushing has shown by his animal experiments that after the most radical removal a thin veil of the anterior portion remains behind.

² I shall use in the future, instead of the vioform or isoform gauze, the old iodoform gauze, which seems to have more disinfecting activity.

³ *Deutsche Zeitschrift f. Chirurgie*, Band c.

⁴ The Removal of Tumors of the Pituitary Body by an Infranasal Route, *Journal of the American Medical Association*, November, 1909.

⁵ The cases of Halstead and Mixer were demonstrated at the meeting of the American Surgical Society, May 3, 1910.

removes the contents of the nasal cavity in many sittings, and the same method seems to have been followed by West.

I had the pleasure of witnessing yesterday an hypophysis operation performed by Dr. Cushing, whose technique (similar to that of Kanavel and Halstead) impressed me so favorably—as it avoids as well any bone lesion as any incision of the skin—that I have decided to give it a trial on the next occasion. Still, I would mention that the scar in my last cases did not cause a too great deformity. It also seems to me that temporary resection, at least, of the nose, giving as it does a larger access to the field of operation, must in certain cases be of decided advantage.

We shall be able to achieve more in regard to vision only when the family physicians shall refer their cases earlier to the surgeon for operation. According to v. Frankl-Hochwart, the time of development of acromegaly, as he was able to glean from his observations of 124 cases, is a very long one, extending over many years, but the prognosis is only bad with regard to the vision. The operation must be regarded as a dangerous one as yet, but I believe that if we tell a patient that his malady continuously will get worse and finally lead to blindness, that he will rather submit to a very dangerous surgical procedure than to keep on doing nothing, and lingering into absolute helplessness.

Gentlemen, I have concluded what I have to say in regard to operations on the hypophysis. It was a great pleasure to me to report in your Association some experiences in this regard, because for many years I have been acquainted with many American surgeons, and I have always followed with great interest the remarkable progress which surgery has made in the last few decades in America. During the last few weeks I was able to satisfy myself, by personal observation, how strictly scientifically, seriously, and with what excellent technique you are working in this country. If in the past every American surgeon during the time of his development once or several times has taken a trip to Europe for studies, it has become a necessity that the European surgeon cross the ocean to study American institutions of science

and hospitals. It is my opinion that through such personal exchange of ideas between foreign lands and nations, not only science but personal friendship is greatly cultivated and the ties which are binding the educated of all nations are drawn tighter, and in such a manner the idea of a general peace among nations is greatly increased.